Medical Science

Awareness of Rheumatoid Arthritis among Saudi Arabian population

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DISCOVERY
SCIENTIFIC SOCIETY

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ABSTRACT

Background and aim of the work: Rheumatoid arthritis (RA) is a chronic inflammatory condition. Its common symptoms are joint pain, stiffness, discomfort, hotness, and edema. Untreated RA can cause extensive damage to the joints and surrounding tissue. Increasing public awareness of RA is crucial for early diagnosis and treatment. *Methods:* This study aimed to assess the level of knowledge about rheumatoid arthritis among the general population in Saudi Arabia. A cross-sectional study was conducted on 370 participants using an online questionnaire tested for content and faced validity and distributed using Google Forms. *Results:* Most of the studied population learned about RA through reading, family history, or hearing about it. Over half identified RA as a chronic auto-immune disease, with 78.9% correctly identifying symptoms. Age group and family history were identified as risk factors for most of the participants. Common complications included bone erosion and joint deformity (64.1%), joint damage (61.1%), bone thinning, and osteoporosis (57.3%). Most participants had a fair to good knowledge of RA (36% and 32%, respectively). Female gender, university education, and source of knowledge were positively associated with raised awareness. *Conclusion:* The study revealed fair to good knowledge about RA among the Saudi population. Most correctly identified RA as a chronic autoimmune disease and recognized key symptoms and risk factors. The study emphasized the need for continuous public health authorities to raise awareness about RA in the general population.

Keywords: Saudi Arabia, Rheumatoid Arthritis, Awareness, Knowledge

1. INTRODUCTION

Rheumatoid arthritis (RA) is a progressive chronic inflammatory disorder that deteriorates with time. It is a condition that impacts the connective tissue and mainly targets the peripheral joints. As the disease advances, high and low levels of disease would impact symptoms and functional abilities. The condition progresses, causing permanent alterations in the joints. A typical clinical sign of

rheumatoid arthritis is prolonged stiffness in the morning that lasts for over an hour. Additional signs and symptoms include joint swelling, deformity, discomfort, and restricted movement. Rheumatoid arthritis also substantially influences family life, social connections, and psychological well-being. Furthermore, individuals suffering from RA are unable to do their regular activities in their personal and professional lives (Martinec et al., 2019).

Raising patients' awareness aims to maintain and improve their health or, in other circumstances, to help slow the progression of the disease. Two studies investigated public awareness of RA in two Saudi Arabian cities to assess the knowledge about RA. The first study was in 2018 among the population of TAIF City. In this study, 52.4% of participants knew the symptoms, diagnosis, and prevention of RA, but there was a lack of knowledge about its causes and complications (Alrashdi et al., 2022). The other study was carried out in 2020 in Jazan and concluded that the population was unaware of RA, and the average knowledge of symptoms of RA was 38.54%. Delays in obtaining medical advice for undiagnosed individuals and adverse effects for those diagnosed individuals can be linked to this (Hazzazi et al., 2020).

For contradictory results found in these studies, our study focused on the level of awareness of the Saudi Arabian population about RA. There is limited awareness about RA among the population of Saudi Arabia. Lack of knowledge about RA among the Saudi population leads to poor results and delayed diagnosis. The first step to improving early diagnosis is raising awareness about RA. Raising awareness about the treatment of RA is essential to maintain or improve health and, sometimes, to impede the advancement of the illness (Hazzazi et al., 2020). Determining the factors that might lead to late diagnosis and treatment of Saudi Arabian patients with RA could ultimately contribute to improved outcomes nationally (Barhamain et al., 2017).

In Saudi Arabia, the exact reasons leading to late diagnosis of patients with RA remain unknown (Eleishi and Allison, 2009). Increasing public awareness of the disease is achieved through public education programs that make use of the media, the internet, brochures, and professional counseling. Furthermore, campaigns for inflammatory arthritis, particularly RA, can raise awareness of RA, but such initiatives have not been undertaken frequently in Saudi Arabia (Elhussein et al., 2018). So, our study aimed to describe and explore the awareness of the Saudi Arabian population about rheumatoid arthritis.

2. MATERIALS AND METHODS

Design of the study, estimation of sample size, and selection of participants
A cross-sectional study was conducted on 370 adult Saudis to examine the level of knowledge about rheumatoid arthritis. The sample size was measured using the Epi-Info software calculator from the Centers for Disease Control (CDC), which has a 95% confidence level and a 5% alpha error. Convenient sampling was used for the enrollment of the individuals.

Study population and eligibility criteria
The criteria for inclusion are adult individuals above 18 years old. All male and female candidates must sign a consent form, complete the questionnaire, and have internet access for online submission. We did not include healthcare providers and medical students due to the potential impact of their educational background on their responses. The participants were asked to provide a consent form for the study. An introduction at the beginning of the questionnaire informed them about the study's aim, clarifying that their participation was deliberate and that the obtained data would be censored. Additionally, all responses were collected namelessly, and participants' data was coded during data management. Without giving a justification or facing repercussions, people were free to decline participation or withdraw.

Data collection and study variables
A digital Google form containing a self-administered online survey was distributed across different social media channels such as Twitter, WhatsApp, and Snapchat, between October 2023 and January 2024.
The questionnaire has been divided into the following sections:
Sociodemographic data of the studied population (gender, age, education) and source of information about RA.
Awareness of RA symptoms and risk factors.
Awareness of complications.
Awareness about the treatment and prognosis.

Awareness about the effect of COVID-19 on RA.

Validity and reliability

An expert panel of public health, internal medicine, and family medicine assessed the questionnaire for content validity. It was evaluated for face validity through a pilot study in which it was administered to 30 participants to ensure the clarity and understandability of the questions and answer choices. They obtained feedback from the pilot study, and no modifications were made. After that, they distributed the questionnaire for data collection.

Data management and statistical analysis

The information was encoded, inputted, and managed using Microsoft Excel (2019 version). The analysis of the data was conducted using version 25 of IBM's SPSS software. Descriptive measures, such as frequencies and proportions, were used to explain qualitative variables. Tables and figures were utilized to display the findings. Multivariable regression analysis was employed to evaluate factors associated with a high level of knowledge. A p-value below 0.05 was considered to be statistically significant with a 95% confidence level.

3. RESULTS

This study involved 370 participants, with over two-thirds falling in the age range between 18 and 30 years, 59.2% female, and nearly two-thirds were university students (Table 1).

Table 1 General features of the participants (n=370)

General characteristics		Frequency	Percent
Age (years)	18-30	253	68.4
	>30-40	45	12.2
	>40-50	41	11.1
	>50	31	8.4
Gender	Male	151	40.8
	Female	219	59.2
Education	Before college	132	35.7
	University student	238	64.3

The majority of the participants learned about RA through reading about it (17.9%), having a family member with RA (18.7%), or hearing about it without full knowledge (16.7%) (Figure 1). Over half of the participants have accurately recognized RA as a chronic autoimmune condition (55.9%), while approximately three-quarters correctly identified its symptoms (78.9%). Additionally, over 50% accurately identified age and family history as risk factors for RA (Table 2).

More than half of the participants identified bone erosion and joint deformity (64.1%) as the primary complications of RA, followed by decreased ability to walk for short distances (63.2%), potential need for surgery due to joint damage (61.1%), bone thinning and osteoporosis (57.3%), and impact on life expectancy (52.4%) (Table 3). Over half of the respondents gave accurate responses regarding certain items on treatment and prognosis of RA as physical therapy is included in treatment (67.8%), early diagnosis and treatment can prevent progression (67.8%), permanent cure is possible (67.3%), surgery may be necessary in certain situations (63.5%), multiple medication choices are now accessible for treatment (53.8%), and long-term treatment is needed for life (50%) (Table 4).
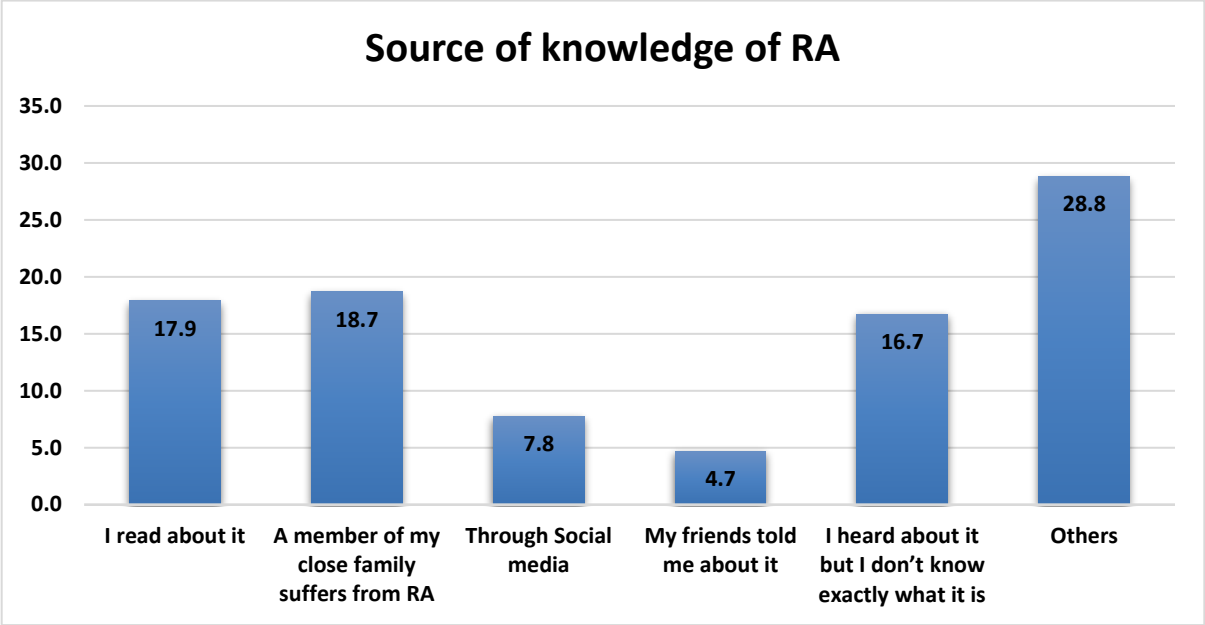
Source of knowledge of RA

Figure 1 Source of knowledge among the studied participants who ever heard of rheumatoid arthritis (n=370)

Table 2 Knowledge of RA symptoms and risk factors among the studied participants (n=370)

RA symptoms and risk factors*		Frequency	Percent
Nature of disease (Is a chronic auto-immune disease)		207	55.9
Symptoms (Tender, warm, swollen joints, Joint Stiffness)		292	78.9
Risk factors	Gender	146	39.5
	Age	228	61.6
	Family	185	50
	Smoking	125	33.8
	Obesity	36	9.7
	Previous joint injury or previous infection/	173	46.8
	Difficult condition/ working status (setting for long periods)	44	11.9

*Correct answers

Table 3 Knowledge of RA complications among the studied participants (n=370)

RA complications*	Frequency	Percent
People with RA might have a high risk of developing heart disease or diabetes	105	28.4
RA patient can feel numbness, tingling, burning, and itching in the palm	155	41.9
RA patients can face sleeping issues/ depression and anxiety	180	48.6
RA patients can develop bumps and nodules under the skin	137	37
RA can cause bone thinning and osteoporosis	212	57.3

RA patients can suffer from joint damage that might require surgery	226	61.1
RA patients can face skin complications	126	34.1
RA patients are more likely to develop cancer	61	16.5
RA patients can have inflammation in other areas of the body	160	43.2
RA patient is risked of infection more than other people without RA	111	30
RA patients might suffer from Anemia	97	26.2
RA can result in bone erosion and Joint deformity	237	64.1
RA can negatively affect a person's life expectancy	194	52.4
RA can negatively affect a person's ability to walk short distances	234	63.2
RA can impact the body's internal organs.	144	38.9

*Correct answers

Table 4 Knowledge of RA treatment and prognosis among the studied participants (n=370)

RA treatment and prognosis*	Frequency	Percent
There are many medication options now available for the treatment of RA	199	53.8
Physical therapy is also part of the treatment paradigm	251	67.8
Surgery might be needed in some cases	235	63.5
Herbal/ natural remedies	152	41.1
Usually, RA requires long-term treatment for the rest of life	185	50
Rheumatoid arthritis can be cured permanent	249	67.3
The joint damage caused by RA is irreversible	140	37.8
A disease progression can be stopped or prevented if diagnosed and treated early	251	67.8
If uncontrolled disease, patients with RA might die earlier than the general population	102	27.6

*Correct answers

However, fewer than 33% of them acknowledged the correlation between RA and susceptibility to COVID-19, as well as the potential for complications and death if infected (Table 5).

Table 5 Knowledge of Rheumatoid arthritis with coronavirus COVID-19 among the studied participants (n=370)

RA treatment and prognosis*	Frequency	Percent
Individuals with rheumatoid arthritis have a higher vulnerability to infection with the coronavirus than other	92	24.9
Individuals diagnosed with rheumatoid arthritis have an increased likelihood of complications and death than other patients when they are infected with the coronavirus	111	30

*Correct answers

The overall score of knowledge was calculated by summing up all the right responses and then dividing by the total number of questions. Next, we categorized the knowledge level into four quartiles: poor (below 25%), fair (25%-<50%), good (50%-<75%), and excellent (>75%). Most of the studied participants had a fair and reasonable level of knowledge about RA (36%) and (32%), respectively (Figure 2).

Figure 2 Level of knowledge among the studied participants (n=370)

Female gender, university education, and previous knowledge of RA have been positively linked to higher knowledge levels in the multivariable linear regression model analyzing potential predictors of RA knowledge among the participants studied (Table 6).

Table 6 Multivariate regression analysis for the level of knowledge about RA among the studied participants (n=370)

Independent variables	Unstandardized Coefficients		Standardized Coefficients	t	P-value	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
Gender	2.726	0.83	0.166	3.284	0.001*	1.094	4.359
Age	-0.242	0.422	-0.029	-.573	0.567	-1.071	0.587
Education	2.598	0.863	0.154	3.010	0.003*	0.9	4.295
Source of knowledge	0.346	0.147	0.12	2.355	0.019*	0.057	0.635

*P-value is statistically significant.

4. DISCUSSION

Population awareness of rheumatic diseases is essential because a lack of knowledge and understanding might delay seeking medical care (Raciborski et al., 2017). The objective of this research was to evaluate the level of awareness of rheumatoid arthritis among the population of Saudi Arabia through the distribution of an online survey. In our study, the average knowledge of symptoms of RA was 78.9%. A similar study was accomplished in the Jazan region in Saudi Arabia, where the awareness level was 38.54%. A total of 370

participants were included in our study. Of all participants' ages, 68.4% were between 18 and 30 years old and showed very high levels of knowledge. Alrashdi et al., (2022) conducted a study in Qassim City, Saudi Arabia, and revealed that the population had a poor understanding of RA; the average awareness of RA was (41.8%).

In our study, 59.2% of the respondents were females, while 40.8% were males. The same results were found in a study conducted in Jazan, Saudi Arabia, by (Hazzazi et al., 2020). Most of the participants in our study were University students (64.3%), and 35.7% were before college. In terms of the disease's nature, our research found that 55.9% of participants accurately recognized RA as a chronic autoimmune condition. Similar studies were conducted in Egypt, indicating that the general population had limited knowledge about the characteristics of RA, with only a tiny percentage being able to recognize RA as an autoimmune disorder (El-Saman et al., 2020). The symptoms of RA are (tender, warm, swollen joints and joint stiffness) 78.9% of the participants accurately recognized to have a strong understanding of them.

Most of the educated participants showed a high level of awareness, which could explain the comparable findings in a study done in Taif City, Saudi Arabia, where most participants demonstrated good knowledge of symptoms of rheumatoid arthritis, with many recognizing more than one symptom (Elhussein et al., 2018). According to Versini et al., (2014), obesity is a significant environmental factor influencing the development and progression of autoimmune disorders like RA. In our study, more than half of the participants correctly identified age (61%) and family history (50%) as the main risk factors for RA, while only 9.7% believed obesity was a risk factor. Concerning gender, we observed that 39.5% of our study subjects acknowledge that gender plays a role in the risk for rheumatoid arthritis, with women being at higher risk. A previous study in the UK found that just 28% of participants knew this information.

Additionally, in our study, 33% nominated smoking as a risk factor for RA, like a study in the Jazan area linking smoking to the development of RA. Only 11.9% of participants in our study associated difficult working conditions (sitting for long periods) with RA. In contrast, 46% accurately identified prior joint injury or prior infection as a risk factor for RA. Regarding the level of knowledge of RA, our study demonstrated that most participants had fair to good awareness of RA (36% and 32%, respectively, knowledgeable of RA). The knowledge distribution of our participants was as follows: 22% had poor knowledge, 36% had fair knowledge, 32% had high knowledge, and only 10% had excellent knowledge. Higher levels of knowledge were positively associated with female gender, university education, and source of knowledge if they ever heard about RA. The study implemented in Jazan, Saudi Arabia, by Hazzazi et al., (2020) revealed that the population had poor knowledge of RA.

According to that survey, 38.54% of individuals were aware of the symptoms of RA. Our findings ran counter to that evidence. An education level that is correlated with knowledge explains this inadequate knowledge. The participants' awareness of RA was found insufficient in the study conducted in Qassim, Saudi Arabia by (Alrashdi et al., 2022). A community-based survey in Riyadh City, Saudi Arabia, revealed that 77% of patients were aware of rheumatic diseases; this high level of awareness was explained by the fact that most of the sample population had higher education (Alenzi et al., 2022). Our findings were consistent with this survey. A study in Upper and Lower Egypt by Raciborski et al., (2017) found that 48.7% of individuals had inadequate knowledge, 26.4% had average knowledge, and just 12.6% had good knowledge. This outcome aligns with the research conducted by El-Saman et al., (2020) in Sohag, Egypt.

None of the participants had a level of knowledge classified as "excellent" in rheumatic diseases; instead, most were categorized as being either low or moderate (48.4% and 24.8%, respectively). The study proved the following: residence, occupation, and education level are the main factors that impact people's knowledge and attitude toward rheumatic disorders. More than half of the participants in our study selected bone erosion and joint deformity (64.1%), negatively affecting a person's ability to walk short distances (63.2%), joint damage that might require surgery (61.1%), bone thinning and osteoporosis (57.3%), and negatively affecting a person's life expectancy (52.4%) as the most common complications of RA. Participants in a study accomplished in Lebanon by Menassa et al., (2022) are witnessed to be knowledgeable about critical symptoms of RA, such as joint pain, tenderness, swelling, and stiffness.

More than two-thirds of respondents stated that the condition could result in bone thinning and osteoporosis (83%), as well as joint damage that might necessitate surgery (67%), bone erosion, and joint abnormalities (67%). Less than 50% of the participants in this study selected the development of heart disease or diabetes (28.4%), palm numbness and burning (41.9%), sleep problems, depression and anxiety (48.6%), bumps and nodules (37%), skin issues (34.1%), cancer risk (16.5%), inflammation in other body areas (43.2%), higher infection risk compared to those without RA (30%), anemia (26.2%). They better understood that RA impacts internal organs (38.9%). Also, in this study, more than half of the people involved did not know that individuals with RA have a higher risk of

developing other health issues that can have a substantial effect on their overall well-being, such as cancer (79.2%), anemia (75.6%), heart disease or diabetes (70.9%), skin disorders (64.3%), and mental health issues like depression and anxiety (54.1%).

Most of the survey respondents acknowledged that surgery is a critical component of the treatment of RA (63.5%), over 50% (53.8%) were aware of the various medication choices for these chronic, progressive inflammatory conditions, physical therapy (67.8%), herbal/natural remedies (41.1%). In the study conducted in Lebanon by Menassa et al., (2022), the participants acknowledged that surgery (83%) and physical therapy (80%) are essential components of the treatment approach for RA. Moreover, about three-quarters of participants knew the benefits of treating RA, such as preventing disease progression and irreversible joint damage. They also understood that continuous treatment is necessary to sustain these benefits. However, around two-thirds of those interviewed incorrectly thought that RA is curable.

Individuals diagnosed with RA faced an increased likelihood of experiencing severe acute COVID-19 in the early stages of the pandemic compared to the general population. In comparison to the general population, patients with RA were more likely to suffer from acute lung injury and hyperinflammation. In our study, less than one-third agreed that there is an association between RA and susceptibility to COVID-19 and the risk of complications and death if infected. A study conducted in the UK provided evidence that patients with RA are at an increased risk of COVID-19, although vaccination reduces the incidence of severe COVID-19 (Wang et al., 2022). A population-based survey from England, which included 10,926 COVID-19-related deaths using the Open SAFELY platform, demonstrated that individuals diagnosed with autoimmune diseases like rheumatoid arthritis (RA), lupus, or psoriasis had a higher chance of COVID-19-related death (Williamson et al., 2020).

The current study has several limitations that affect the reliability and applicability of its findings. First, it predominantly involves a young, university-educated demographic within the 18-30 age range, primarily from a specific region in Saudi Arabia, which may not represent the broader population's knowledge or awareness of rheumatoid arthritis (RA). Additionally, the research relies on self-reported data, biased by participants' desire to present themselves in a favorable light or by their memory inaccuracies. The cross-sectional design of the study restricts its capacity to monitor changes over time or confirm causal connections. Lastly, the absence of clinical verification to compare reported knowledge with actual comprehension or management behaviors of the disease means the study might not entirely reflect the practical awareness and comprehension of RA.

5. CONCLUSION

The research reveals that Saudi Arabian populations have a fair to good knowledge about rheumatoid arthritis, with most being young adults and college students. The knowledge was reasonable regarding identifying RA as a chronic autoimmune disease and acknowledging symptoms and risk factors. Factors such as female gender, university education, and the source of information significantly predicted high levels of knowledge of RA.

Recommendations

The study emphasizes the need for continuous public health awareness and education to broaden the understanding of RA and address misconceptions and gaps in knowledge—particularly regarding the disease's broader health implications and its association with other severe conditions. By improving public awareness through tailored educational programs, especially in regions with lower initial awareness, healthcare outcomes for individuals with RA can potentially be improved, reducing the disease's impact on individuals and the healthcare system.

Integrating RA education into general health curricula in schools and universities can boost early awareness. Further awareness and community engagement could be through seminars, health fairs, and strengthened collaboration with healthcare providers to promote awareness of RA. Future research should include a more diverse demographic encompassing various ages, education levels, and regions to enhance the study's representativeness. Longitudinal studies are recommended to monitor RA knowledge progression over time and assess the impact of educational interventions.

Author's Contributions

Fatma Ghoneim, Ayat Elzayat, Banan Hassan, Raghba Alharbi, Bushra Zaynol, and Farah Alshumayri planned the study, formulated the research protocol, and collected the data. Ayat Elzayat conducted the statistical analysis. All authors shared the writing of the manuscript. Fatma Ghoneim and Ayat Elzayat reviewed and edited the article. All authors approved the final version of the manuscript.

Ethical approval

The study was approved by the Institutional Review Board of Fakeeh College of Medical Sciences, Jeddah (Approval no. 169/IRB/2021).

Informed consent

Not applicable

Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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